SCIENCE

YEAR 8 PROGRESS HIERARCHY

	Knowledge and Understanding	Recording and presenting data	Analysing and Interpreting Data	Working Scientifically	Scientific mathematical skills
Mastering	Students show a high degree of knowledge, skills and application. Students can describe processes and phenomena using abstract ideas and appropriate terminology, They take account of a number of factors or use abstract ideas or models in their explanations of processes and phenomena. They apply and use knowledge and understanding in unfamiliar contexts. Students make full use of scientific vocabulary.	Students can justify their chosen method of chart or graph for displaying results and recognise when to use zero or non-zero starting points for axes. Plot a scatter graph using decimal points accurately. Can identify anomalous results.	Students will be able to use a range of scientific techniques with confidence and make judgements about the best technique to produce the best quality data. They will be able to consider issues of accuracy and precision in their analysis of data. Students will be able to describe with confidence the extent to which results support a prediction.	Can write a detailed hypothesis to include a simple scientific explanation. Include an equipment list, explaining the purpose of each piece of equipment. Identify the independent, dependent and control variables. Student will be able recognise how to amend a strategy to produce reliable data. Can suggest modifications to their plan following a review of results.	Use of fractions and percentages to express ratio and/or probability Begin to use equations using symbols rather than words. Balancing of simple chemical equations Can use a scientific calculator for complex mathematical functions.
Deepening	Consistently shows a good standard of knowledge, skills and application. Students can communicate their ideas coherently and using scientific vocabulary. They can explain processes and phenomena, in more than one step or using a model. They apply and use knowledge and understanding in familiar contexts.	Students are able to present data in a table with correct headings and units. Record all data to an appropriate number of decimal places/significant figures. Determine suitable scales for each axis and draw an appropriate line of best fit Accurately plot a scatter graph using whole numbers Calculate averages values for experimental data.	Students will be critical of the data they produce and will be able to explain whether or not a set of data or an investigative strategy will produce reliable data. They will be able to suggest improvements to produce better quality data. Students will be able to describe with confidence whether results support or refute a simple prediction and take into account anomalous results. Students will be able to explain their observations using key scientific ideas and make a judgement about the extent to which data supports a conclusion.	Write a detailed plan that gives sufficient detail for the experiment to be repeated. Identify all of the main hazards associated with the investigation and suggest sensible precautions to minimise risk. Students apply strategies to reduce experimental error and can explain how random and systematic errors affect data. Student can make a comment on the accuracy of your results by looking at the trend they follow (how close the points are to a line of best fit on a graph)	Can deal with very large or small values and can complete calculations using given formulae. Can easily convert between most commonly used SI prefixes. Be able to identify the range of a set of data.
Securing	Shows reasonable level of subject knowledge and skills and can sometimes apply confidently to tasks. Students can communicate their ideas in an understandable way using some accurate scientific vocabulary appropriate to the topic.	Students are able to present data in a table with correctly labelled headings with units. Determine which variables should be on each axis Plot results in a suitable graph for the data collected (bar or line graph) with appropriate scale.	Students can analyse their results to draw scientific conclusions that are consistent with the evidence. Make a general claim for accuracy or repeatability for their investigation and give a reason for any anomalous results.	Be able to write a prediction of what they think will be the outcome. Write a method for the investigation and explain the need for repeat measurements. Identify some hazards or risks associated with the experiment Some consideration to minimise errors.	Interpret with appropriate accuracy numbers on a range of measuring instruments. Be able to calculate the mean of a set of data. Measuring length and calculating area. Use of scaled drawings (.e.g. force arrows) Be able to carry out multi-stage calculations using a calculator.
Developing	Students can use key scientific terms in the correct way and apply to the task. Pupils can state some processes and phenomena in simple terms.	Students can construct their own table with correct headings and units, Label the data as continuous or categoric and from this choose the most appropriate graph type to plot depending on the data.	They will be able to recognise simple patterns in data and recognise obvious anomalies. They will be able to use this with some success to explain their observations linked to a simple Scientific explanation. Students can draw simple conclusions from a data set.	Students will be able to use simple practical scientific techniques and make choices of basic equipment to investigate a prediction, produce results and be able to say whether the results support or refute the prediction.	Begin to use simple formula expressed in words. Interpret numbers on a range of measuring instruments.
Emerging	Can recall, define and *use* some simple key terms related to the topic of study.	Students can select the correct headings for a table and input data correctly. Students can plot a simple graph with guidance.	Can read data from a simple graph (line & bar-chart) and recognise a trend. Should be able to recognise for changes, patterns, similarities and differences in their data.	Recognise and name some simple scientific apparatus.	Use angular measures in degrees. Can accurately read values off a mass balance, metre rule, and thermometer.